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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/762,849  
Filing Date: January 22, 2004  
Appellant(s): PRINCE ET AL.

**MAILED**

**MAY 03 2007**

**Group 3700**

Timothy N. Trop  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed January 22, 2007 appealing from the Office action mailed October 11, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows: claims 1-5 and 11-15 are also rejected under 35 U.S.C. 112, second paragraph as being indefinite to particularly point out and distinctly claim the subject matter which appellant regards as the invention. Appellant, however, noted and argued this rejection on page 10, lines 23-27 of the brief.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

3,715,842

TREDINNICK ET AL

02-1973

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-5 and 11-15 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The invention as claimed now is directed to "an unthickened" silica slurry, which is not supported in the specification as originally filed.

Claims 1-5 and 11-15 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The above claims recite the limitation "unthickened", rendering the claims indefinite, since it is unclear as to what elements should be lacking and/or what elements should be in the slurry to meet the limitation.

Claims 11 and 12 (as best understood) stand rejected under 35 U.S.C. 102(b) as anticipated by Tredinnick et al. or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tredinnick et al. in view of Applicant's Admitted Prior Art (AAPA).

Tredinnick et al. discloses all of the limitations of claim 11, i.e., aging a silica slurry for at least fifty days (12 weeks, e.g., 01:49-55) from its manufacture date and using to CMP a metallic layer, i.e., metalloid germanium, e.g., 01:04, however in the alternative, it is known in the art to use silica slurry in the CMP step of damascene process in manufacturing semiconductor integrated circuits as admitted by Applicant on page 1. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to use the silica slurry with the thickening agent as disclosed by Tredinnick et al., in the damascene process to define a copper line in a trench, as this process is known in the art, to prevent scratching the workpiece.

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Claims 1-5 and 13-15 (as best understood) stand rejected under 35 U.S.C. 103(a) as being unpatentable over Tredinnick et al. in view of AAPA.

Tredinnick et al. meets all of the limitations of claims 1 and 6, as explained above, except for using it on a tantalum-containing layer. As indicated in section 6, it would have been obvious for one of ordinary skill in the art to use the slurry of Tredinnick et al. in a damascene process, which meets the limitations as recited.

#### **(10) Response to Argument**

Appellant filed an RCE on February 16, 2006 in response to the final rejection mailed out on January 23, 2006 and in reading over prior art applied (Tredinnick et al.) amended the claims to recite for an "unthickened" slurry as currently under appeal. The issue raised then, now under appeal is that whether this limitation introduces new matter to the specification and whether this limitation, lacking sufficient description or definition by originally filed specification, is met by prior art under its broadest reasonable definition. Appellant argues that disclosure as originally filed does not have to provide *in haec verba* support for the claimed subject matter at issue and that one of ordinary skill in the art would have known that the inventor is in the possession of the invention (page 10, lines 3-10). The appellant argues that it was not necessary to state in the present application that the slurries were unthickened, and to prove this point uses the reference cited as a proof that the existing slurries were unthickened.

While examiner generally agrees with the statement that disclosure as originally filed does not have to provide *in haec verba* support for the claimed subject matter, the argument is not persuasive in this case. The disclosure as originally filed teaches that silica abrasives used in tantalum barrier layer polishing includes silica particles suspended in a basic pH solution (page 1, lines 15-19) and it further discloses that the slurry involves a fluid mixture including silica and basic pH solution in one embodiment (page 2, lines 23-25). This passage indicates

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that the fluid mixture *includes* silica and basic pH solution, clearly indication other elements in the fluid mixture. The argument is whether this passage or disclosure in general excludes "thickening" as argued by the Appellant. As a matter of fact it is noted that Appellant, even in filling the brief, has not yet defined what is meant by "unthickened" only that it is not thickened. Appellant is apparently attempting for the office to define how one of ordinary skill in the art would define "unthickened". One attempting to define the term based on the arguments and explanations provided by the appellant would conclude that an "unthickened" slurry means one not having water soluble cellulose derivatives. It may also appear that Appellant firstly defines "thickened" slurry as a one having viscosity modifiers, and apparently one that increases the viscosity, and secondly it appears that Appellant believes that "existing" slurries lack "thickening" agent. Neither of these assertions are described in the specification or in fact are "absolute" in view of one of ordinary skill in the art. Any additives may "thicken" the slurry as broadly defined (a fluid mixture that has several additives are "thicker" than one with fewer additives) and not necessarily modify its viscosity, further viscosity modifying agent were well known and were used in the art, so "existing" slurry may in fact had included viscosity modifying agents. Still further, some pH modifying agents also act as viscosity modifying agent. One of ordinary skill in the art, knows that existing slurry (prior to 2004) may include a wide variety of additives, e.g., corrosion inhibitors, viscosity modifying agent, stopping compounds, static etch controllers, accelerators, metal halides, surfactants, stabilizers, metal chelating agents, buffing agent, antiflocculating agents, oxidizing agents, pH buffers, dispersing agents or suspension agents and number of other additives chosen for the intended use, any one of which "thickens" the slurry. The statement that one of ordinary skill in the art would have known that existing slurry means one not having viscosity modifying agent is totally erroneous. It is also noted that disclosure as originally filed is not concerned with viscosity. The disclosure contemplates that

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without limitations it is believed that sufficiently aged slurries have softened silica particle agglomerations in a basic solution, in addition the slurry may be more shear sensitive when aged and that it may also be possible that particle size distribution also decreases with age (page 3, lines 15-23). The disclosure as complying to the requirements of best mode of the invention does not suggest, hint or limit the inventive slurry with respect to viscosity modifying agent, and to amend the claims to recite "unthickened" slurry lacks sufficient support in the specification as examined in view of one of ordinary skill in the art.

With regards to indefiniteness rejection, one of ordinary skill in the art does not automatically or necessarily define "unthickened" silica slurry for one not having water soluble cellulose ether, since thickened slurry may be defined as an agent modifying the viscosity or it may be defined as a slurry thickened for example with an antiflocculating agents. Therefor it is unclear what is meant by "unthickened"? Does it mean slurry not having viscosity modifying agents, whether they increase or reduce the viscosity? Does it exclude slurries with high viscosity, because a slurry may have high viscosity without additives, since viscosity also depends on temperature, size and type of abrasives, other elements in the composition, e.g., coupling agents, etc. Does it mean slurries not having dispersion agents, or does it mean slurries not having agents to prevent settling which in turn may or may not have any effects on the viscosity. It is also noted, in supporting the position taken by the Office that references cited in the first office action, prior to the claims being amended with the new term, included Kim et al. (US 2004/0020134), which discloses in paragraph 24 that TMAH, a pH modifier, also improves the dispersion and decreases the viscosity, so does the term "unthickened" also exclude pH modifiers like TMAH? Thus the scope of the claims (particularly in view of specification as originally filed, i.e., lack of description for this term) is unascertainable.

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With regards to the anticipation and/or obviousness rejections, the office has not ignored any limitations, only applied prior art to the broadest reasonable definitions of the terms. In this case Tredinnick et al. while may not be applicable to the claims when "unthickened" slurry is defined as one excluding water soluble cellulose derivatives, it is certainly applicable to the claims "as best understood" when the term is defined as a slurry not having, e.g., antiflocculating agents, corrosion inhibitors or surfactants or even agents producing high viscosity, since the reference is concerned with prevention of settling and this may be achieved by modifying other factors, e.g., decreasing zeta potential increases slurries' stability.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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